

Amendments to the Drawings:

The attached sheets of drawings includes changes to FIGS. 1, 2 and 3a-b. These sheets, which include FIGS. 1, 2 and 3a-b, replace the original sheets including FIGS. 1, 2 and 3a-b. In these Figures, improperly labeled elements are changed and previously omitted elements 20b, 30b, and 30c are added.

Remarks

I. Status of Claims

After the above amendments, claims 1-13, 15-20 are pending in the application. Claim 14 is canceled without prejudice and/or disclaimer to the subject matter therein. Claims 15-20 are newly added. Claims 1, 15, and 17 are independent. Claims 1-5 and 7-12 are currently amended. Support for amended claim 1 and newly added independent claims 15 and 17 can at least be found in paragraphs [0027], [0033], and [0034] of the specification as published.

The Office action objects to portions of the specification for allegedly having minor informalities.

Claims 1-13 stand rejected under 35 U.S.C. 112, first paragraph, for lacking enablement. Claims 1-13 stand rejected under 35 U.S.C. 112, second paragraph as allegedly being indefinite.

Claims 1-13 stand rejected under 35 U.S.C. 102(b) as allegedly being anticipated by Hamada et al. (JP2001-357869) (hereinafter “Hamada ‘869”). Claims 1-9 stand rejected under 35 U.S.C. 102(b) as allegedly being anticipated by Sakai et al. (JP63-119166) (hereinafter “Sakai ‘166”).

II. Specification

In the specification as published, paragraphs [0017] and [0028] are amended to correct minor editorial problems.

III. Drawings

In amended FIGS. 1, 2 and 3a-b, reference numerals are changed to correct minor editorial errors.

IV. 35 U.S.C. § 112, first and second paragraph, Rejections

Claims 1-13 stand rejected under 35 U.S.C. 112, first paragraph, for lacking enablement and Claims 1-13 stand rejected under 35 U.S.C. 112, second paragraph as allegedly being indefinite. The claims have been amended to correct any perceived ambiguity to obviate the rejections under 35 U.S.C. § 112, first and second paragraphs.

V. Pending Claims

Hamada '869

i. Claims 1-13 stand rejected under 35 U.S.C. 102(b) as allegedly being anticipated by Hamada '869 and Sakai '166.

The Applicant also submits that claim 1 is at least patentable over the cited references because it recites, “...each cell of the cell blocks having at least one separator including a groove of a gas passage of the separator, the groove having a plurality of spaced ribs thereon, wherein a pitch between the ribs of one cell block is different from a pitch between the ribs of another cell block.” (emphasis added)

Neither Hamada '869 or Sakai '166 disclose a separator having ribs that are formed along a groove of a gas passage of the separator. Furthermore, neither reference discloses a pitch between the ribs of one cell unit being different from a pitch between the ribs of another cell block. Comparatively, Hamada '869 discloses that cell units located in the ends of a fuel stack may have grooves of a gas passage of a separator which are deeper than cell units located elsewhere on the fuel stack. Therefore, the fuel cell in Hamada '869 increases the depth of the groove in the separators of the cells at the two ends of the fuel cell stack, and requires an increase in the thickness of the separator. In contrast, in embodiments of the present invention, the cross-sectional area of the gas passage groove may be increased within an in-plane direction of the separator to minimize the fuel cell stack size.

For at least these reasons, claim 1 and its dependent claims are patentable over the cited references.

ii. Newly added independent claim 15

The Applicant also submits that claim 15 is at least patentable over the cited references because it recites, “...wherein the length of the gas passage of one of the at least two cell blocks is different than the length of the other cell block.”

Hamada '869 and Sakai '166 simply do not disclose cell units having gas passages extending from a gas supply port to a gas discharge port of different lengths (e.g., full lengths). In contrast, the present invention may increase the cross-sectional area of a gas passage groove within in-plane direction of a separator to minimize the size of the fuel cell stack.

For at least these reasons, claim 15 and its dependent claims are patentable over the cited reference.

iii. Newly added independent claim 17

The Applicant also submits that claim 17 is at least patentable over the cited references because it recites, "...one of the cell blocks having groove surfaces which are subjected to water-repellent or hydrophilic treatment."

Hamada '869 and Sakai '166 do not discuss or disclose subjecting groove surfaces of a gas passage of a cell block to water repellent or hydrophilic treatment. Hamada '869 only discloses that the water repellency of the cathode gas diffusion layer of each cell unit may be made lower than that of cell units located elsewhere. However, in order to strengthen drainage performance (e.g., water repellency or hydrophilic properties) of a fuel cell, it is insufficient to make only the cathode water repellant. Accordingly, due to flow resistance of the separator groove surface, it may be important that the fuel cell drain away water, such as water discharged from the cathode and/or condensed water, from the separator groove surface to the outside of the fuel cell. Therefore, utilizing embodiments of the present invention, it may be possible to drain water to the outside of the fuel cell more effectively by providing cell units with groove surfaces subjected to water repellant and/or hydrophilic treatment.

For at least these reasons, claim 17 and its dependent claims are patentable over the cited references.

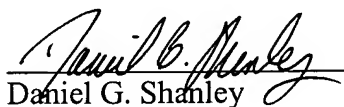
VI. Conclusion

In light of the above discussion, Applicant respectfully submits that the present application is in all aspects in allowable condition, and earnestly solicits favorable reconsideration and early issuance of a Notice of Allowance.

The Examiner is invited to contact the undersigned at (202) 220-4420 to discuss any matter concerning this application. The Office is authorized to charge any fees related to this communication to Deposit Account No. 11-0600.

Respectfully submitted,

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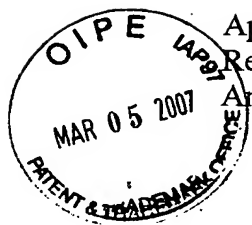
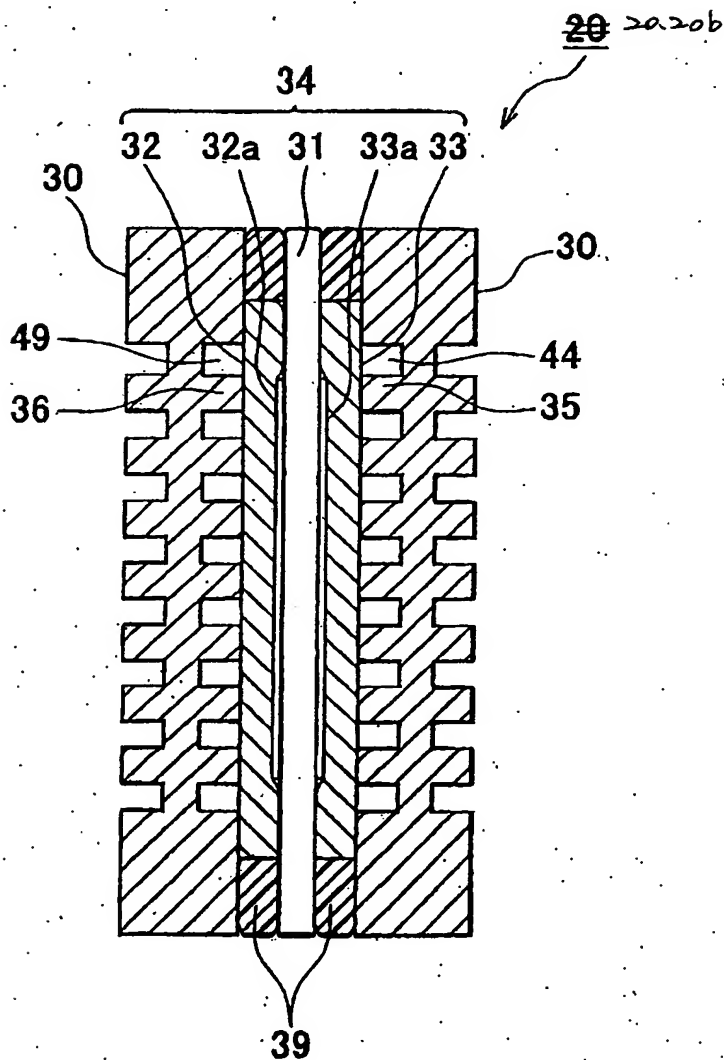


FIG. 2



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FIG. 3A

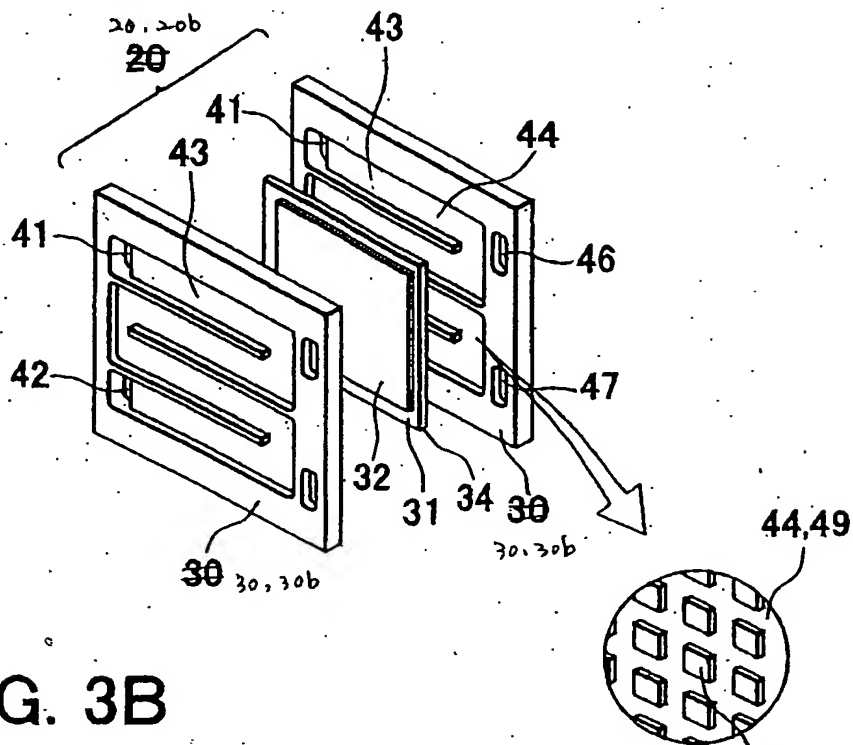
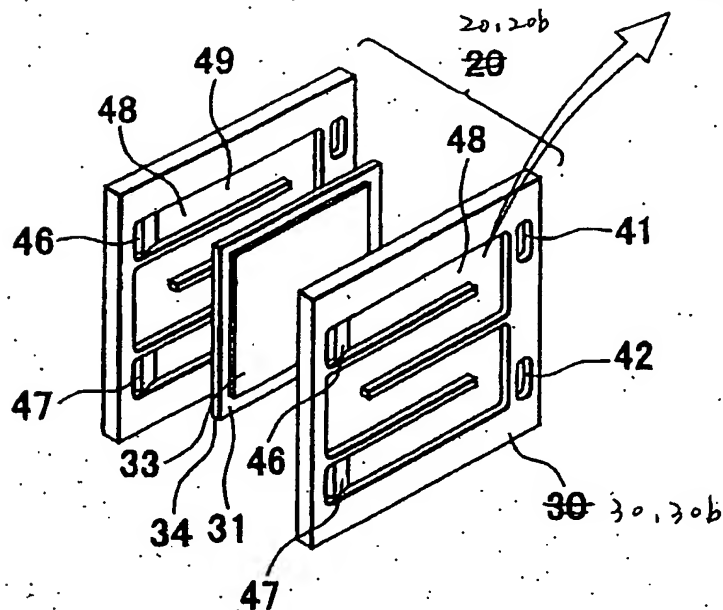


FIG. 3B



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